WHAT IS CLAIMED IS:

1. A method for detecting and identifying low-level radioactive sources moving past at least two stationary detectors, comprising the steps of:

determining and storing background spectra for each of a first detector and a second detector, said background spectra representing an expected number of background counts in a channel for a period of time corresponding to an acquisition time slice, j;

inputting from said first detector and said second detector a first and second number of counts, respectively, in the channel during the acquisition time slice, j;

calculating a first probability that said first number of counts is due to said background spectra;

calculating a second probability that said second number of counts is due to said background spectra;

comparing said first and second probabilities to a threshold;

in response to both said first and said second probabilities being below said threshold, identifying a source of said first and second number of counts as a radioactive source; and

in response to only one or neither of said first and said second probabilities being below said threshold, adding said first and second number of counts to said background spectra.

2. The method as set forth in claim 1, wherein said acquisition time slice, j, is one-third to one-half of a smallest expected interaction time.

3. The method as set forth in claim 1, further comprising the steps of:

inputting from said first detector and said second detector, respectively, a previous number of counts during an acquisition time slice, j-1;

comparing said first and second number of counts with said previous number of counts; and

in response to a correlation between said first and said number of counts and said previous number of counts, identifying the source of said first and second number of counts as a radioactive source; and

in response to only one or neither of said first and said number of counts correlating with said previous number of counts, identifying the count source as background spectra.

4. The method as set forth in claim 1, further comprising the steps of:

inputting from said first detector and said second detector, respectively, a previous number of counts during an acquisition time slice, j-1, and a subsequent number of counts during an acquisition time slice, j+1;

comparing said first and second number of counts with said previous and said subsequent number of counts during time slices j-1, j+1; and

in response to a correlation between said first and said number of counts and at least one of said previous and subsequent number of counts, identifying the source of said first and second number of counts as a radioactive source; and

in response to only one or neither of said first and said number of counts correlating with said previous or subsequent number of counts, identifying the count source as background spectra.

5. The method as set forth in claim 1, further comprising the steps of:

inputting from said first detector and said second detector, respectively, a third and fourth number of counts from another channel adjacent said channel;

comparing said first and second number of counts with said third and fourth number of counts, respectively; and

in response to a correlation between said first and said number of counts and said third and fourth number of counts, identifying the source of said first, second, third and fourth number of counts as a radioactive source; and

in response to only one or neither of said first and said number of counts correlating with said third and fourth number of counts, identifying the count source as background spectra.

6. The method as set forth in claim 5, wherein a plurality of adjacent channels are input for count comparison, a number of said plurality of adjacent channels increasing with a numeric value of said channel.

7. The method as set forth in claim 6, wherein the numeric value of said channel is between 26-75, and the number of said plurality of adjacent channels from which count sums are taken is three.

8. The method as set forth in claim 6, wherein the numeric value of said channel is between 76-125, and the number of said plurality of adjacent channels from which count sums are taken is five.

9. The method as set forth in claim 6, wherein the numeric value of said channel is between 126-175, and the number of said plurality of adjacent channels from which count sums are taken is seven.

10. The method as set forth in claim 6, wherein the numeric value of said channel is between 176-250, and the number of said plurality of adjacent channels from which count sums are taken is nine.

11. A method for detecting and identifying low-level radioactive sources moving past at least two detectors, comprising the steps of:

determining and storing background spectra for each of a first detector and a second detector, said background spectra representing an expected number of background counts in an energy bin for a period of time corresponding to an acquisition time slice;

inputting from said first detector and said second detector a first and second number of counts, respectively, in the energy bin during the acquisition time slice;

calculating a first probability that said first number of counts is due to said background spectra;

calculating a second probability that said second number of counts is due to said background spectra;

comparing said first and second probabilities to a first threshold and a second threshold, said first threshold being greater than said second threshold;

in response to both said first and said second probabilities being less than said first threshold, or to either said first and said second probabilities being less than said second threshold, identifying a source of said first and second number of counts as a radioactive source;

in response to only one or neither of said first and said second probabilities being less than said first threshold, adding said first and second number of counts to said background spectra.

12. The method as set forth in claim 11, wherein said energy bin includes a plurality of adjacent channels, said first and second probabilities representing a sum of probabilities obtained from said plurality of channels.

13. The method as set forth in claim 11, wherein said step of inputting includes inputting counts from said first and second detectors for at least two sequential time slices, said first and second probabilities being calculated by adding probabilities obtained from counts for each time slice.

14. The method as set forth in claim 11, wherein said first threshold has a value of approximately 10^{-6} and said second threshold has a value of approximately 10^{-9}.

15. The method as set forth in claim 1, further comprising the steps of:

inputting from said first detector and said second detector, respectively, a previous number of counts received by each detector during an acquisition time slice, j-1;

adding said first and second number of counts with said previous number of counts, respectively to obtain first and second sums; and

performing said steps of calculating the first and second probabilities using said first and second sums.

16. The method as set forth in claim 1, further comprising the steps of:

inputting from said first detector and said second detector, respectively, a previous number of counts received by each detector during an acquisition time slice, j-1, and a subsequent number of counts during an acquisition time slice, j+1;

adding each of said first and second number of counts with respective previous and subsequent numbers of counts, to obtain first and second sums; and

performing said steps of calculating the first and second probabilities using said first and second sums.

17. The method as set forth in claim 1, further comprising the steps of:

inputting from said first detector and said second detector, respectively, a third and fourth number of counts from another channel adjacent said channel;

adding said first and second number of counts with said third and fourth number of counts, respectively, to obtain first and second sums; and

performing said steps of calculating the first and second probabilities using said first and second sums.

18. A method for detecting and identifying low-level radioactive sources moving past at least two detectors, comprising the steps of:

determining and storing background spectra for each of a first detector and a second detector, said background spectra representing an expected number of background counts in an energy bin for a period of time corresponding to an acquisition time slice;

inputting from said first detector and said second detector a first and second number of counts, respectively, in the energy bin during the acquisition time slice;

calculating a first probability that said first number of counts is due to said background spectra;

calculating a second probability that said second number of counts is due to said background spectra;

inputting from said first detector and said second detector a third and fourth number of counts, respectively, in the energy bin during a subsequent adjacent acquisition time slice;

calculating a third probability that said third number of counts is due to said background spectra;

calculating a fourth probability that said fourth number of counts is due to said background spectra;

adding said first and third probabilities to obtain a first probability sum;

adding said second and fourth probabilities to obtain a second probability sum;

comparing said first and second probability sums to a first threshold and a second threshold, said first threshold being greater than said second threshold;

in response to both said first and said second probability sums being less than said first threshold, or to either said first or said second probability sum being less than said second threshold, identifying a source of said counts as a radioactive source;

in response to only one or neither of said first and said second probability sums being less than said first threshold, adding said first, second, third and fourth number of counts to said background spectra.

19. The method as set forth in claim 18, wherein said first threshold has a value of approximately 10^{-6} and said second threshold has a value of approximately 10^{-9}.